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(57) The door has a pair of hinge mountings 12, 13 on one edge and a latch mounting 15 on the opposite edge. The latch mounting is joined to each of the hinge mountings by a separate girder 16, 17. A vehicle

equipped with such a door has corresponding structural members for the hinge and latch mountings in the body of the vehicle so that the vehicle body is able to transmit compressive loads arising from front or rear collisions across the closed doors by way of the girders.



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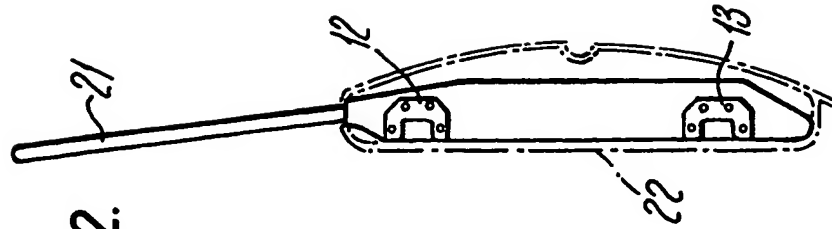


Fig. 2.

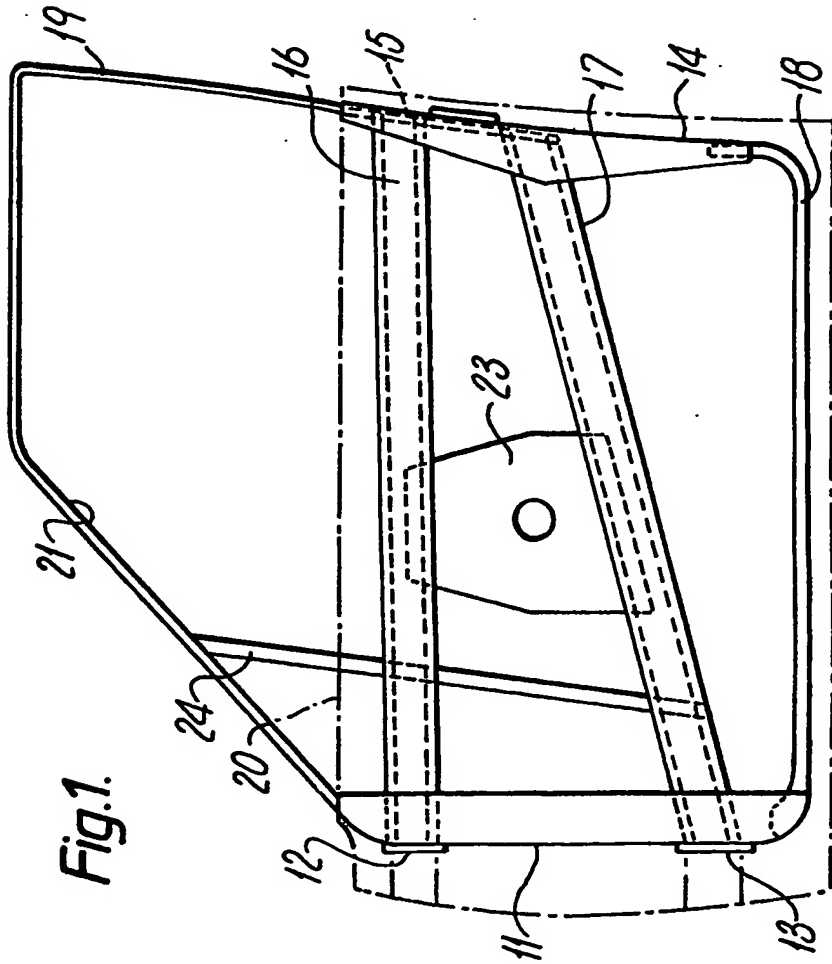


Fig. 1.

SPECIFICATION **A vehicle door**

This invention relates to a door for a vehicle.

A vehicle door usually consists of inner and
5 outer pressings joined together by clinched
flanges making use of adhesives or welding. In
some cases the whole door may consist of
pressings which include an upper frame work for a
glazing arrangement. In other cases smaller
10 pressings are used for the bottom part of the door
with a separate rolled section framework for the
glazing arrangement which is usually welded or
bolted to the door pressing. This type of door
needs reinforcement to sustain compressive loads
15 due to front or rear impacts on the vehicle and in
some countries protection from lateral impact is
required by law. Current legislation also calls for
protection against a door coming open during
impact or other adverse conditions so that the
20 latching and hinging arrangements of the door
have to provide an anti-burst requirement.

According to a first aspect of the present
invention there is provided a door for a vehicle
comprising a first peripheral region on which are
25 disposed a spaced pair of hinge mountings for
pivotably connecting the door to a vehicle body; a
second peripheral region, opposite the first region,
on which is disposed a mounting for a latch for the
door; a first girder member extending between
30 one of the hinge mountings and the latch
mounting and rigidly attached to both mountings;
and a second girder member extending between
the other of the pair of hinge mountings and the
latch mounting and rigidly attached to both
35 mountings.

According to a second preferred form of the
first aspect of the present invention the girder
members have mounted on them at least part of a
40 door mechanism such as a latch, window guide or
window winder.

According to a third preferred form of the first
aspect of the present invention a door for a vehicle
according to any of the previous forms includes
45 external cladding in the form of an outer skin panel
and an inner cladding in the form of a trim panel.

According to a fourth preferred form of the first
aspect of the present invention a door according
to the third preferred form is characterised in that
50 both the skin panel and the cladding panel are
unstressed.

According to a second aspect of the present
invention there is provided a vehicle having at
least one door according to any form of the first
55 aspect which door is coupled to the body by way
of a hinge linking each hinge mounting on the
door to a hinge mounting on the vehicle body; and
there is provided a latch linking the latch mounting
on the door to a latch mounting on the vehicle
body, the hinge and latch mountings of the vehicle
60 body being coupled to structural members of the
vehicle body adapted to resist compressive loads
arising from front and/or rear impacts on the
vehicle.

According to a second preferred form of the
65 second aspect of the present invention, there is
provided a vehicle according to the first preferred
form wherein the door girder members, at least
with the door closed, co-operate with structural
members of the body to resist lateral impacts on
70 the door.

An embodiment of the invention will now be
described with reference to the accompanying
drawings in which Figure 1 is an outside view of
the vehicle door; and Figure 2 is a view of the door
75 in Figure 1 in the direction of the arrow II.

The door shown in the Figures has a front edge
11 on which are mounted a spaced pair of hinge
mountings 12, 13. On the opposite side of the
door the second peripheral region 14 has mounted
80 on it a latch plate 15. The hinge mounting 12 and
the top of the latch mounting 15 are rigidly
coupled by a U-section girder 16. The lower hinge
mounting 13 is likewise coupled to the latch plate
15 by a second U-section girder 17. The front and
85 rear peripheral regions of the door 11, 14 are
joined at their lower ends by a lower door frame
member 18 and at their upper end by a window
guide channel frame 19.

The form of the outer cladding for the door is
90 shown by a broken outline 20. The inner side of
the door frame below the window aperture 21 is
masked by a trim panel 22 shown in Figure 2. The
door latch and window winders are not shown but
are mounted on plate 23 extending between the
95 girders 16, 17. The girders also serve to carry a
window guide channel 24 which serve to locate
the leading edge of the window panel (not shown).

The load carrying structure of the door is made
up of what could be described as the triangulated
100 connection between the girders 16 and 17 the
latch plate 15 and the hinge mountings 12, 13.
This triangulated arrangement carries the upper
door framework made up of the channels 19 and
21 for the vertical operation of the window. The
105 triangulated structure allows for a ready change to
the cladding provided for the exterior and the
interior finish of the door since these have very
little or no stressing in use.

In a vehicle making use of the door described in
110 connection with Figures 1 and 2 the
complementary hinge mountings to the
mountings 12 and 13 on the door are
incorporated in further girder systems so that front
or rear impacts on the vehicle result in loads which
115 are fed into the girder system of which girders 16
and 17 form a part. In this way the resultant
compressive loads are fed into the whole vehicle
structure. Among other advantages this will act to
reduce the distortion of the door openings which
120 can occur in such impacts.

The girders 16 and 17 also serve to resist side
impacts on the door and hinge mountings 12 and
13 and latch plate 15 can be angled so that lateral
impacts on the door are fed by the girders 16 and
125 17 into complimentary structural members in the
vehicle body. In this way both the hinges and the
latch would not be required to sustain the entire

loading arising from the lateral impact.

CLAIMS

1. A door for a vehicle comprising a first peripheral region on which are disposed a spaced pair of hinge mountings for pivotably connecting the door to a vehicle body; a second peripheral region, opposite the first region, on which is disposed a mounting for a latch for the door; a first girder member extending between one of the hinge mountings and the latch mounting and rigidly attached to both mountings; and a second girder member extending between the other of the pair of hinge mountings and the latch mounting and rigidly attached to both mountings.
2. A door as claimed in Claim 1 wherein the girder members have mounted on them at least part of a door mechanism such as a latch, window guide or window winder.
3. A door for a vehicle as claimed in Claim 1 or Claim 2 including external cladding in the form of an outer skin panel and an inner cladding in the

form of a trim panel.

4. A door as claimed in Claim 3 characterised in that both the skin panel and the cladding panel are unstressed.
5. A door for a vehicle as hereinbefore described with reference to, and as illustrated in the accompanying drawing.
6. A vehicle having at least one door according to any preceding claim which door is coupled to the body by way of a hinge linking each hinge mounting on the door to a hinge mounting on the vehicle body; and there is provided a latch linking the latch mounting on the door to a latch mounting on the vehicle body, the hinge and latch mountings of the vehicle body being coupled to structural members of the vehicle body adapted to resist compressive loads arising from front and/or rear impacts on the vehicle.
7. A vehicle as claimed in Claim 5 wherein the door girder members, at least with the door closed, co-operate with structural members in the body to resist lateral impacts on the door.

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